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VARIETY TESTS OF SUGARCANES IN LOUISIANA DURING THE CROP YEAR 1929-30

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INTRODUCTION

While the production of sugar considered from a world standpoint has become very unprofitable under existing market conditions, brought about largely as a result of overproduction, the Louisiana sugarcane growers, encouraged by the performance of the mosaic-tolerant sugarcane varieties P. O. J. 36,[2] P. O. J. 36-M, P. O. J. 213, and P. O. J. 234, now in general cultivation, and by the promise shown by the varieties C. P. 807 and Co. 281, are making encouraging progress in adapting their operations to the economic situation. The P. O. J. varieties now grown afford yields of cane and sugar per acre equal to, and in many instances exceeding, the yields of the old varieties previous to the mosaic epidemic in Louisiana, and coincident with the commercial culture of these varieties the considerably increased efficiency which has been achieved, particularly in connection with field operations, has tended to a reduction in production costs.

Interest in the sugarcane variety tests of 1929–30 centers around the performance of the varieties C. P. 807 and Co. 281. These varieties were made available for commercial planting in October, 1930, by the United States Department of Agriculture and its cooperators, the Louisiana State University and the American Sugar Cane League. There were used as seed cane on plantations 397 tons of C. P. 807 and 595 tons of Co. 281, the area planted being about 200 and 300 acres, respectively.

[1] Acknowledgment is made to E. D. Roberts, formerly of the Division of Sugar Plant Investigations, for assistance in conducting some of the tests reported in this circular, and to the managements of the various factories where tests were conducted, for their cooperation.

[2] An explanation of the abbreviations used to designate sugarcane varieties appears as a footnote to Table 2.

The decision to release these varieties was based on carefully controlled experimental tests for a period of three years at the United States Sugar Plant Field Station, Houma, La.; the Louisiana Agricultural Experiment Station, Baton Rouge, La.; and on 10 representative plantations in Louisiana. In these tests they were compared with hundreds of new varieties as well as the standard varieties. In conformity with the established policy of the three cooperating institutions engaged in these studies, propagating material of C. P. 807 and Co. 281 was withheld from commercial culture until it was proved beyond a reasonable doubt that they are superior to the present standard commercial varieties in certain desired qualities.

ORIGIN AND CHARACTERISTICS OF C. P. 807 AND CO. 281

C. P. 807 is a hybrid seedling developed at the United States Sugar Plant Field Station at Canal Point, Fla., its designation "C. P." being an abbreviation of Canal Point. Two of the ancestors of C. P. 807 stand out very prominently in Louisiana: Black Cheribon (known in that State as Louisiana Purple) and P. O. J. 213. Black Cheribon was the standard cane in the sugarcane-growing sections of the United States for many years; in fact, it may be said that the sugarcane industry of the United States was founded upon it. For nearly a century it was productive of wealth for the State, but during recent years the yields of this and the other "noble" varieties that had long been grown declined rapidly as a result of the attack of the mosaic disease, and by 1926 these varieties were no longer capable of producing profitable yields. The planters are familiar with the P. O. J. varieties that were introduced at that time, and with the rapid revival of the industry as a result of the cultivation of these varieties, but it may not have occurred to them that P. O. J. 213, which soon became the leading variety, largely took the place of its parent variety Black Cheribon. It is remarkable that P. O. J. 213 is tolerant of the mosaic disease, when both of its parents are susceptible to this disease.

The lineage of C. P. 807 is as follows:

Black Cheribon (female) × Chunnee (male)

P. O. J. 213
Self-fertilized (?)
↓
U. S. 1643
Self-fertilized
↓
C. P. 807

On March 17, 1921, seed from P. O. J. 213 that had been grown in India was received from Coimbatore, India. The complete history of this seed is not available. It is possible that it may have resulted from a crossing of P. O. J. 213 with an unknown male parent. The seed was sown on March 24 at the United States Sugar Plant Field Station, Canal Point, Fla., and the seedlings obtained were planted out in July, 1921. In February, 1922, one of the seedlings of this progeny was given the number U. S. 1643. Its habit of growth was described as "reclining to erect, very prolific, 9½ feet tall, stalks 1⅛ inches in

diameter, nodes 6 to 8 inches long, pale green to yellow, semiclean, leaves average width." Trials of U. S. 1643 showed that it was not suitable for commercial culture in the United States.

In 1924 self-fertilized seed was obtained from U. S. 1643. This seed was planted in the spring of 1925, and the seedlings obtained were planted out during the summer. A certain seedling of this progeny was selected and given the number C. P. 807. Cuttings of C. P. 807 were sent, on February 11, 1926, to the United States Sugar Plant Field Station, Houma, La., and the Louisiana Agricultural Experiment Station, Baton Rouge, La. C. P. 807 appears particularly valuable for the heavier soils because of its tolerance of poor drainage and its hardiness and resistance to the root disease complex. It has thus far shown complete immunity to mosaic, both in the field and in experimental inoculations at Washington. Its vigorous growth and good stubbling qualities should greatly reduce cultivation and weeding costs. On the other hand, its slightly higher fiber content and often crooked stalks will somewhat increase harvesting and milling expenses, which, however, will be small in comparison with the greatly increased yields obtained.

The variety Co. 281 is also a hybrid seedling. It was produced at the Imperial Sugarcane Station, Coimbatore, south India, and as in the case of C. P. 807 is a descendant of P. O. J. 213. The lineage of Co. 281 is shown graphically, as follows:

Black Cheribon (female) × Chunnee (male)	Ashy Mauritius (female) × Saccharum spontaneum (male)
P. O. J. 213. (female)	Co. 206. (male)
Co. 281	

It is thus seen that Co. 281 is one generation closer to the original cross than C. P. 807. Cuttings of Co. 281 were imported from India by the United States Department of Agriculture in 1924. After the quarantine period it was distributed to field stations of the department in Louisiana, Florida, and Porto Rico, and to interested experiment stations in the West Indies and throughout the American Tropics. Observations on Co. 281, therefore, have been possible over a wide range of territory under many different environmental conditions, and it is noteworthy that the seedling has proved good enough to attract attention in several localities. With respect to mosaic, the observations on Co. 281 are not altogether consistent. Unlike C. P. 807 it has been reported to take this disease when exposed to natural infection, but the resulting injury is greater or less in different places. In Louisiana its tolerance of mosaic appears to be about the same as the P. O. J. varieties commonly grown there.

Co. 281 has given best results in the river and bayou districts and is chiefly valuable because of its high sucrose content, straight growth, and superior yields of sugar per acre. It withstands early cutting much better than P. O. J. 234, and this advantage, combined with nearly equal earliness and superior yields, constitutes an important advance in the development of an indispensable early milling variety. However, its unsatisfactory ratooning under certain conditions, brittleness, and susceptibility to injury by storms are recognized weaknesses which will doubtless limit the usefulness of this variety under Louisiana conditions.

SEASONAL CONDITIONS

Weather conditions during the 1929–30 winter were extremely unfavorable. Excessive rainfall and intermittent periods of unseasonably high temperatures throughout the period during which the cane usually remains dormant resulted in conditions conducive to serious deterioration, and on March 4, 1930, an unseasonably severe freeze killed back the cane, which in most sections had attained an advanced stage of growth. This freeze caused serious injury to stubble cane and had the effect of delaying the growth of sugarcane in general from two to three weeks, and greatly reduced the benefits in the way of earliness ordinarily derived from early fall planting. Poor stands were prevalent in both plant cane and stubble, and in extreme cases even plant cane had to be abandoned on account of insufficient stands. P. O. J. 213 plant cane seemed to have been more adversely affected by the above-mentioned unfavorable combination of weather conditions than that of any of the other released varieties and generally gave imperfect stands in the spring, but through subsequent "suckering" and growth this variety largely overcame this early handicap and made a very satisfactory showing at harvest, both in comparative tests and in large-scale plantings.

Table 1 summarizes rainfall data for 1930 as recorded at the field station at Houma, La., and on four cooperating plantations at different localities in the Louisiana sugarcane section. These data show a considerable rainfall deficiency during April, May, June, and July, the deficiency being particularly serious in June. This drought materially interfered with the growth of cane. Its damaging effect was particularly pronounced in the western parishes, where the growth of sugarcane was delayed to such an extent that the crop at the beginning of harvest was from two to three weeks behind its usual stage of maturity.

TABLE 1.—*Amount and distribution of rainfall at the five sugarcane test fields in Louisiana during 1930*

Station	January		February		March		April		May		June		July	
	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches
Erath	5	9.95	3	2.12	5	2.47	2	4.40	2	4.30	2	0.70	5	4.16
Cypremort	6	12.25	4	1.75	5	4.75	3	4.25	2	4.00	2	.75	9	6.25
Raceland	6	9.77	4	2.78	6	3.85	4	2.60	2	2.08	2	1.47	8	6.26
Greenwood	5	9.44	5	3.32	6	3.00	2	1.42	2	1.45	2	.85	8	4.55
Houma	4	8.88	5	2.84	10	3.16	3	3.03	1	1.20	5	.84	11	8.77
Normal for Houma [1]	----	3.64	----	4.41	----	3.29	----	4.01	----	3.51	----	5.50	----	8.77

Station	August		September		October		November		December		Total rainfall	
	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches
Erath	7	6.10	10	8.74	4	4.69	9	3.24	2	3.61	56	54.48
Cypremort	8	7.50	8	7.00	5	4.50	8	6.75	6	4.75	66	64.50
Raceland	8	8.30	11	10.34	5	4.40	8	7.97	6	1.58	70	61.40
Greenwood	7	8.42	8	8.89	4	4.12	9	9.21	4	1.46	62	56.13
Houma	9	6.23	15	8.92	10	5.42	8	5.93	6	3.17	87	58.39
Normal for Houma [1]	----	6.99	----	5.71	----	3.43	----	2.71	----	4.75	----	56.72

[1] Normal annual rainfall for other areas in sugar belt ranges from approximately 55 to 60 inches.

Weather conditions during the fall months approached normal, showing a slight excess of rainfall, which, however, did not seriously interfere with harvesting operations. Except on the northern edge of the cane belt, no seriously low temperatures were experienced before December 23, when a minimum temperature of 26° F. was recorded at Houma. By that time there remained in the field only a small quantity of cane, which was all saved without the necessity of "windrowing" before any considerable deterioration had taken place.

EXPERIMENTAL METHODS

Plot arrangement, sugarcane sampling, and statistical interpretation employed in these experiments have been described in previous publications.[3] Yields of sugar, except where otherwise mentioned, were calculated according to the method described by Rands and Sherwood by the Winter-Carp (Java) formula, using factor for polarization (sucrose) 0.920, factor for Brix 0.954, assumed normal juice extraction 78 per cent, and boiling-house efficiency number 100 per cent, and are based on average juice analyses of 12 samples of cane each consisting of 50 stalks selected from the field at random in such manner that the entire area covered by the replications of the particular variety sampled was proportionately represented. These samples were crushed by means of a small 3-roller mill giving an extraction of approximately 60 per cent, and a separate analysis of the juice of each sample was made.

PLANT-CANE VARIETY TESTS

The results of comparative plant-cane tests conducted with commercial varieties and the promising ones under experimental observation are summarized in Tables 2, 3, 4, 5, 6, and 7.

TABLE 2.—*Results of plant-cane variety [a] tests on light soil on the Godchaux plantation, Raceland, La., in 1930*

[The generalized probable error of the difference in average yield of cane per acre between any two varieties = ±0.88 ton]

Variety	Acre yields of cane [b]	Laboratory-mill juice analyses						Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Preliminary analyses, Nov. 6			Harvest analyses, Dec. 9			Per ton of cane	Per acre	
		Brix	Sucrose	Purity	Brix	Sucrose	Purity			
	Tons [c]		*Per cent*			*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36–M	26.58				16.13	12.68	78.61	165.3	4,394	12.10
P. O. J. 213	25.23	13.81	10.09	73.07	15.55	12.53	80.58	165.8	4,183	12.06
P. O. J. 234	23.66				17.24	14.81	85.91	203.0	4,803	9.85
C. P. 177	24.39	13.63	9.55	70.07	16.56	13.21	79.77	173.9	4,241	11.50
C. P. 766	30.70	13.87	9.50	68.50	15.73	11.53	73.30	143.7	4,412	13.92
C. P. 807	33.22	13.36	9.55	71.48	15.81	12.96	81.97	173.2	5,754	11.55
Co. 281	26.65	14.20	10.35	72.89	16.67	13.79	82.72	185.4	4,941	10.79

[a] Many varieties of sugarcane are commonly designated by letters or other abbreviations indicating the origin of the seedling cane. The meanings of such designations for the varieties mentioned throughout this circular are as follows: Co. = Coimbatore (India) seedlings; C. P. = Canal Point (Fla.) seedlings; P. O. J = Proefstation Oost Java seedling; P. O. J. 36–M = Mingka selection of P. O. J. 36; U. S. = U. S Department of Agriculture, best selections from Canal Point seedlings.

[b] Average of 12 replications. Plots of one-thirtieth of an acre.

[c] Tons of 2,000 pounds are used throughout this circular.

[3] RANDS, R. D., and SHERWOOD, S. F. YIELD TESTS OF DISEASE-RESISTANT SUGARCANES IN LOUISIANA U. S. Dept. Agr. Circ. 418, 20 p. illus., 1927.

———SHERWOOD, S. F., and STEVENS, F. D. SUGAR CANE VARIETY TESTS IN LOUISIANA DURING THE CROP YEAR 1926-27. U. S. Dept. Agr. Circ. 36, 15 p., 1928.

ARCENEAUX, G., and STEVENS, F. D. VARIETY TESTS OF SUGARCANES IN LOUISIANA DURING THE CROP YEAR 1927-28. U. S. Dept. Agr. Circ. 88, 16 p. illus., 1929.

———and GIBBENS, R. T. VARIETY TESTS OF SUGARCANES IN LOUISIANA DURING THE CROP YEAR 1928-29. U. S. Dept. Agr. Circ. 162, 24 p., 1931.

TABLE 3.—*Results of plant-cane variety tests on light soil on the Greenwood plantation, Thibodaux, La., in 1930*

[The generalized probable error of the difference in average yield of cane per acre between any two varieties = ±1.14 tons]

Variety	Acre yields of cane [1]	Laboratory-mill juice analyses						Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Preliminary analyses, Nov. 3			Harvest analyses, Dec. 10			Per ton of cane	Per acre	
		Brix	Sucrose	Purity	Brix	Sucrose	Purity			
	Tons		*Per cent*			*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36-M	20.92				16.05	12.47	77.70	161.4	3,376	12.39
P. O. J. 213	22.08	12.99	9.17	70.60	15.74	12.45	79.10	162.9	3,597	12.28
P. O. J. 234	23.20				17.10	14.27	83.45	192.6	4,468	10.38
C. P. 177	22.27	12.83	8.69	67.73	15.61	11.85	75.91	151.3	3,369	13.22
C. P. 766	28.87	13.97	9.56	68.43	16.02	11.40	71.16	139.2	4,019	14.37
C. P. 807	31.14	13.61	10.26	75.39	15.82	12.60	79.65	165.6	5,157	12.08
Co. 281	27.11	14.86	11.33	76.25	17.07	14.01	82.07	187.4	5,080	10.67

[1] Average of 11 replications. Plots of one-twentieth of an acre.

TABLE 4.—*Results of plant-cane variety tests on light soil on the Cypremort plantation, Louisa, La., in 1930*

[The generalized probable error of the difference in average yield of cane per acre between any two varieties = ±1.15 tons]

Variety	Acre yields of cane [1]	Laboratory-mill juice analyses						Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Preliminary analyses, Nov. 19			Harvest analyses, Dec. 16			Per ton of cane	Per acre	
		Brix	Sucrose	Purity	Brix	Sucrose	Purity			
	Tons		*Per cent*			*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36-M	25.91	15.51	12.08	77.89	16.47	13.42	81.48	178.8	4,633	11.19
P. O. J. 213	26.67	15.95	12.98	81.38	16.11	13.46	83.55	181.8	4,849	11.00
P. O. J. 234	23.88	16.35	13.50	82.57	17.17	14.70	85.62	201.2	4,805	9.94
C. P. 177	22.49	13.62	9.43	69.24	14.76	10.64	72.09	131.2	2,951	15.24
C. P. 807	28.54	15.44	12.30	79.66	16.29	13.59	83.43	183.4	5,234	10.91
Co. 281	24.57	15.74	12.49	79.35	17.23	14.65	85.03	199.8	4,909	10.01
P. O. J. 2725	9.48	14.44	10.46	72.44	15.34	11.83	77.12	152.4	1,445	13.12

[1] Average of 12 replications. Plots of one-twenty-fifth of an acre.

TABLE 5.—*Results of plant-cane variety tests on light soil on the Caldwell plantation, Erath, La., in 1930*

[The generalized probable error of the difference in average yield of cane per acre between any two varieties = ±0.81 ton]

Variety	Acre yields of cane [1]	Laboratory-mill juice analyses						Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Preliminary analyses, Oct. 3			Harvest analyses, Nov. 22			Per ton of cane	Per acre	
		Brix	Sucrose	Purity	Brix	Sucrose	Purity			
	Tons		*Per cent*			*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36-M	17.93	13.68	9.56	69.89	15.20	11.20	73.70	140.1	2,512	14.28
P. O. J. 213	20.63	14.25	10.63	74.60	15.60	12.76	81.80	170.3	3,513	11.74
P. O. J. 234	18.56	14.98	11.48	76.64	16.20	13.30	82.10	177.9	3,302	11.24
C. P. 177	18.66	12.74	7.97	62.56	13.90	9.58	68.92	114.3	2,133	17.50
C. P. 766	22.17	14.05	9.26	65.91	15.19	10.68	70.31	129.3	2,867	15.47
C. P. 807	26.70	13.36	9.57	71.63	14.50	10.90	75.20	138.2	3,690	14.47
Co. 281	20.10	14.71	11.01	74.85	16.70	13.71	82.10	183.5	3,688	10.90

[1] Average of 10 replications. Plots of one-thirty-fifth of an acre.

TABLE 6.—*Results of plant-cane variety tests on mixed soil at the United States Sugar Plant Field Station, Houma, La., in 1930*

[The generalized probable error of the difference in average yield of cane per acre between any two varieties =±1.26 tons in Group 1 and ±1.24 tons in Group 2]

Variety and group	Acre yields of cane[1]	Laboratory-mill juice analyses						Fiber in cane	Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Preliminary analyses, Nov. 1			Harvest analyses, Dec. 8				Per ton of cane	Per acre	
		Brix	Sucrose	Purity	Brix	Sucrose	Purity				
Group 1:	*Tons*		*Per cent*			*Per cent*		*Per cent*	*Pounds*	*Pounds*	*Tons*
P. O. J. 213	27.81	13.18	9.41	71.40	14.89	11.55	77.57	10.36±0.19	149.3	4,152	13.40
C. P. 177	29.77	13.57	9.47	69.79	14.50	10.48	72.27		129.4	3,852	15.46
C. P. 766	33.67	14.17	9.94	70.15	15.15	10.52	69.44		126.2	4,249	15.85
C. P. 807	38.95	13.61	10.26	75.39	15.36	12.26	79.81	13.77± .14	161.4	6,286	12.39
Co. 281	33.37	14.35	10.70	74.57	16.57	13.21	79.72	11.90± .15	173.8	5,800	11.51
Group 2:											
P. O. J. 36	26.55	13.18	8.97	68.06	15.37	11.61	75.54		147.6	3,919	13.55
P. O. J. 36–M	31.01	13.70	9.56	69.78	15.55	11.83	76.07		151.2	4,689	13.23
P. O. J. 213	29.82	12.91	8.99	69.64	15.00	11.79	78.60		153.7	4,583	13.01
P. O. J. 234	26.55	14.63	11.13	76.08	16.18	13.20	81.58	12.64± .12	175.9	4,670	11.37
C. P. 71–B	27.87	14.50	10.62	73.24	16.13	12.44	77.12		160.3	4,468	12.48

[1] Average of five replications. Plots of one-fortieth of an acre.

TABLE 7.—*Results of plant-cane variety tests on heavy soil at the United States Sugar Plant Field Station, Houma, La., in 1930*

[The generalized probable error of the difference in average yield of cane per acre between any two varieties=±1.01 tons in Group 1 and ±1.27 tons in Group 2]

Variety and group	Acre yields of cane[1]	Laboratory-mill juice analyses			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Harvest analyses[2] Dec. 10			Per ton of cane	Per acre	
		Brix	Sucrose	Purity			
Group 1:	*Tons*		*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 213	23.69	15.71	12.73	81.03	169.0	4,004	11.83
C. P. 177	22.26	15.49	11.69	75.47	148.5	3,306	13.47
C. P. 766	30.19	15.78	11.47	72.69	142.1	4,290	14.07
C. P. 807	39.26	15.23	12.05	79.12	157.7	6,191	12.68
Co. 281	27.50	16.87	13.77	81.63	183.7	5,052	10.89
Group 2:							
P. O. J. 36	24.07	15.34	11.56	75.36	146.7	3,531	13.63
P. O. J. 36–M	26.61	15.74	12.04	76.49	154.3	4,106	12.96
P. O. J. 213	22.50	15.22	12.03	79.04	157.3	3,539	12.71
P. O. J. 234	27.01	16.22	13.18	81.26	175.3	4,735	11.41
C. P. 71–B	25.32	15.96	12.09	75.75	154.1	3,902	12.98

[1] Average of five replications. Plots of one-fortieth of an acre.
[2] Preliminary analyses not made.

Field trials with P. O. J. 36, because of the variety's previously demonstrated relative inferiority under Louisiana conditions to other P. O. J. varieties, were confined to the two major sugarcane soil types at the Houma station. (Tables 6 and 7.) In these tests the inability of P. O. J. 36 to compete with P. O. J. 213 in yield of sugar per acre and per ton of cane is again demonstrated.

P. O. J. 36–M closely approximated the performance of P. O. J. 213 with respect to yield of cane per acre and indicated yield of sugar per ton of cane at Raceland (Table 2), Greenwood (Table 3), and on

mixed soil at Houma (Table 6). In tests in the western parishes, the performance of P. O. J. 36–M closely approximated the performance of P. O. J. 213 at Cypremort (Table 4), but at Erath (Table 5) its indicated yield of sugar per ton of cane was 140.1 pounds as compared to 170.3 pounds for P. O. J. 213. In the two last-mentioned tests P. O. J. 36–M gave yields of cane per acre slightly lower than those obtained with P. O. J. 213, but the differences were not sufficiently large to establish definite significance. In the test on heavy soil at Houma (Table 7), P. O. J. 36–M was slightly lower than P. O. J. 213 in indicated yield of sugar per ton of cane, but outyielded P. O. J. 213 in sugar per acre because of its significantly higher yield of cane per acre.

P. O. J. 213, as plant cane, while giving satisfactory yields of cane and sugar, did not display the relative superiority shown in past years. This was chiefly due to the comparatively poor stands obtained with this variety as a result of the unfavorable winter weather conditions previously mentioned, which brought the comparative yields of cane, averaging 24.8 tons per acre in the eight comparative trials, considerably below those obtained in previous years. It maintained, however, its usual satisfactory level of sugar content, indicating an average sugar yield of 165.10 [4] pounds per ton of cane, and 4,044 pounds per acre in the six trials in which it appeared in direct comparison with the other P. O. J. varieties.

P. O. J. 234 plant cane satisfactorily withstood the unfavorable weather conditions prevailing during the winter of 1929–30 and, generally speaking, gave relatively better results than were obtained in previous tests. The yields of cane per acre obtained with this variety were slightly below those obtained with P. O. J. 213 at four of the test fields and slightly above at two of them, but its consistently higher indicated yield of sugar per ton of cane placed its calculated yield of sugar per acre higher than that of P. O. J. 213 in four out of six comparative trials. In the average results of these six tests, P. O. J. 234 outyielded P. O. J. 213 by over 400 pounds of sugar per acre.

C. P. 807 plant cane maintained its usual lead in cane production over all other varieties, exceeding the yield from P. O. J. 213 by a margin of from 2 to 16 tons per acre, with an indicated yield of sugar per ton of cane greater than that from P. O. J. 213 at Raceland, Greenwood, Cypremort, and on mixed soil at Houma, and smaller than that from P. O. J. 213 at Erath and on heavy soil at Houma. In yield of sugar per acre C. P. 807 exceeded all varieties included in the tests, its average calculated yield of sugar per acre for the six plant-cane tests amounting to 5,385 pounds and surpassing that of P. O. J. 213 by 1,341 pounds, an increase of 33 per cent.

Co. 281 plant cane generally outyielded P. O. J. 36, 36-M, 213, and 234 in tons of cane per acre. In the trials at Raceland and Greenwood and in the two trials at Houma it afforded yields ranging from 1½ to 5½ tons more than the yields from P. O. J. 213, and in the trials at Cypremort and Erath yields ranging from one-half to 2 tons less

[4] Figures used throughout text for average pounds of sugar per ton of cane are weighted averages.

than P. O. J. 213. Co. 281 afforded uniformly good yields of sugar per ton of cane during the period through which the plant-cane trials were harvested, the indicated yields for the six trials averaging 185 pounds, or 19.9 pounds more than the average yield from P. O. J. 213 and only 2.48 pounds less than the average yield from P. O. J. 234. The average indicated yield of sugar per acre from Co. 281 for the six trials was 4,911 pounds, or 862 pounds more than the yield from the six trials of P. O. J. 213. Co. 281 afforded an average yield of 26.55 tons of cane per acre as compared with 32.97 tons from C. P. 807 and an average indicated yield of 4,911 pounds of sugar per acre, as compared with 5,385 pounds from C. P. 807.

C. P. 177, while affording fairly good yields of cane and sugar in a few instances, generally made a very poor showing and proved distinctly inferior to P. O. J. 36–M, P. O. J. 213, P. O. J. 234, C. P. 807, and Co. 281, particularly in quality of cane as shown by juice analyses.

C. P. 766, as judged by its performance in these experiments, can not compete under Louisiana conditions with varieties now in cultivation. It afforded comparatively high yields of cane per acre, but the quality of the cane as shown by juice analyses was greatly inferior to that of the other varieties included in the trials, the calculated pounds of sugar per ton of cane ranging from 9 to 23 pounds less than the quantities afforded by P. O. J. 36, P. O. J. 36–M, P. O. J. 234, C. P. 807, and Co. 281.

FIRST-YEAR STUBBLE VARIETY TESTS

Results of first-year stubble variety tests are given in Tables 8, 9, 10, 11, 12, 13, and 14. These are a continuation of plant-cane experiments previously reported.[5]

TABLE 8.—*Results of first-year stubble-cane variety tests on light soil on the Godchaux plantation, Raceland, La., in 1930*

[The generalized probable error of the difference in average yield of cane per acre between any two varieties= ±0.81 ton]

Variety	Acre yield of cane [a]	Laboratory-mill juice analyses						Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Preliminary analyses, Oct. 22			Harvest analyses, Nov. 11					
		Brix	Sucrose	Purity	Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Per cent*			*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36	25.92	13.62	10.08	74.01	15.15	11.75	77.56	151.9	3,937	13.17
P. O. J. 36–M	25.99	14.68	11.58	78.88	15.56	12.17	78.16	158.2	4,112	12.64
P. O. J. 213	26.82	14.22	10.92	76.80	15.44	12.48	80.83	165.4	4,436	12.09
P. O. J. 234	23.40	15.90	13.02	81.89	16.54	13.83	83.62	186.9	4,373	10.70
C. P. 807	36.36	13.92	11.01	79.10	14.94	11.93	79.85	156.9	5,705	12.75
Co. 281	25.39	13.92	10.52	75.58	15.68	12.40	79.10	162.2	4,118	12.33

[a] Average of 12 replications. Plots of one-fortieth of an acre.

[5] ARCENEAUX, G., and GIBBENS, R. T., JR. Op. Cit. (Tables 2 to 8, inclusive.)

TABLE 9.—*Results of first-year stubble-cane variety tests on light soil on the Greenwood plantation, Thibodaux, La., in 1930*

[The generalized probable error of the difference in average yield of cane per acre between any two varieties= ±1.09 tons]

Variety	Acre yield of cane [1]	Laboratory-mill juice analyses						Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Preliminary analyses, Oct. 28			Harvest analyses, Nov. 20					
		Brix	Sucrose	Purity	Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Per cent*			*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36	41.03	13.74	9.88	71.91	15.31	11.57	75.57	147.2	6,040	13.59
P. O. J. 36–M	38.56	13.13	8.97	68.32	14.96	11.07	74.00	139.0	5,360	14.39
P. O. J. 213	40.99	14.07	10.63	75.55	15.12	11.98	79.23	156.9	6,431	12.75
P. O. J. 234	34.19	15.30	12.32	80.52	16.23	13.23	81.52	176.2	6,024	11.35
P. O. J. 2725	41.35	12.05	7.32	60.75	13.76	9.31	67.66	109.6	4,532	18.25
C. P. 177	34.71	14.90	11.12	74.63	16.20	12.47	76.98	160.5	5,571	12.46

[1] Average of six replications. Plots of one-fortieth of an acre.

TABLE 10.—*Results of first-year stubble-cane variety tests on light soil on the Cypremort plantation, Louisa, La., in 1930*

[The generalized probable error of the difference in average yield of cane per acre between any two varieties= ±1.46 tons]

Variety	Acre yield of cane [1]	Laboratory-mill juice analyses						Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Preliminary analyses, Oct. 23			Harvest analyses, Nov. 25					
		Brix	Sucrose	Purity	Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Per cent*			*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36	19.34	12.70	8.53	67.17	16.19	13.11	80.98	173.9	3,363	11.50
P. O. J. 36–M	18.22	13.10	9.30	70.99	16.97	14.16	83.44	191.3	3,485	10.45
P. O. J. 213	21.28	11.90	7.97	66.98	16.29	13.71	84.16	185.9	3,956	10.76
P. O. J. 234	17.35	15.15	11.92	78.68	17.40	15.00	86.21	206.1	3,576	9.70
P. O. J. 2725	12.77	11.25	6.71	59.65	15.65	12.25	78.28	159.3	2,034	12.55
Co. 281	14.31	14.25	10.47	73.48	16.71	13.93	83.36	188.2	2,693	10.63

[1] Average of 12 replications. Plots of one-fortieth of an acre.

TABLE 11.—*Results of first-year stubble-cane variety tests on light soil on the Caldwell plantation, Erath, La., in 1930*

Variety	Acre yields of cane [1]	Laboratory-mill juice analyses						Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Preliminary analyses, Oct. 31			Harvest analyses, Nov. 22					
		Brix	Sucrose	Purity	Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Per cent*			*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36	8.76	13.74	9.88	71.91	15.93	12.50	78.47	162.8	1,426	12.29
P. O. J. 36–M	7.05	13.84	10.02	72.40	16.10	12.71	78.95	166.1	1,171	12.04
P. O. J. 213	12.58± .71	14.55	11.21	77.05	16.38	13.57	82.85	182.4	2,295	10.97
P. O. J. 234	9.38	15.63	12.43	79.53	17.37	14.75	84.92	201.0	1,885	9.95
C. P. 177	4.83	13.71	9.70	70.75	15.59	11.94	76.59	153.2	740	13.06
C. P. 807	20.17± .38	13.80	10.63	77.03	15.71	12.72	80.97	168.8	3,405	11.85

[1] Average of 12 replications. Weights of individual plots not determined except for P. O. J. 213 and C. P. 807. Plots of one-fortieth of an acre.

TABLE 12.—*Results of first-year stubble-cane variety tests on mixed soil at the United States Sugar Plant Field Station, Houma, La., in 1930*

[The generalized probable error of the difference in average yield of cane per acre between any two varieties=±1.24 tons]

Variety	Acre yields of cane [1]	Laboratory-mill juice analyses						Fiber in cane	Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Preliminary analyses, Oct. 28			Harvest analyses, Nov. 20						
		Brix	Sucrose	Purity	Brix	Sucrose	Purity		Per ton of cane	Per acre	
	Tons		*Per cent*			*Per cent*		*Per cent*	*Pounds*	*Pounds*	*Tons*
P. O. J. 36	33.10	14.22	10.50	73.84	15.38	11.69	76.01	12.24±0.24	149.2	4,938	13.40
P. O. J. 36-M	31.49	14.10	10.29	72.98	15.41	11.66	75.67	12.63± .38	148.5	4,676	13.47
P. O. J. 213	30.18	14.56	11.25	77.27	15.33	12.19	79.52	10.97± .30	160.0	4,829	12.50
C. P. 177	28.13	14.81	11.04	74.55	15.57	11.76	75.53		149.6	4,208	13.37
C. P. 807	43.12	14.11	10.91	77.32	15.33	12.45	81.21	13.54± .36	165.5	7,136	12.08
Co. 281	32.42	14.67	11.13	75.87	16.20	13.04	80.49	12.24± .14	172.4	5,589	11.60

[1] Average of six replications. Plots of one-fortieth of an acre.

TABLE 13.—*Results of first-year stubble-cane variety tests on heavy soil at the United States Sugar Plant Field Station, Houma, La., in 1930*

[The generalized probable error of the difference in average yield of cane per acre between any two varieties=±1.39 tons]

Variety	Acre yield of cane [1]	Laboratory-mill juice analyses						Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Preliminary analyses, Oct. 29			Harvest analyses, Nov. 12					
		Brix	Sucrose	Purity	Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Per cent*			*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36-M	27.80	14.53	11.02	75.84	15.24	11.64	76.38	149.0	4,142	13.42
P. O. J. 213	29.75	14.03	10.52	74.98	15.45	12.33	79.81	162.2	4,825	12.33
C. P. 177	27.63	14.57	10.81	74.20	15.25	11.60	76.07	148.2	4,095	13.49
C. P. 807	40.43	14.42	11.35	78.71	15.21	12.22	80.34	161.4	6,525	12.39
Co. 281	28.57	14.84	11.34	76.42	15.98	12.61	78.91	164.7	4,705	12.14

[1] Average of four replications. Plots of one-fortieth of an acre.

TABLE 14.—*Results of first-year stubble-cane variety tests on mixed soil at the United States Sugar Plant Field Station, Houma, La., in 1930*

[The generalized probable error of the difference in average yield of cane per acre between any two varieties =±0.83 ton]

Variety	Acre yields of cane [1]	Laboratory-mill juice harvest analyses, [2] Nov. 3			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 213	29.87	15.19	12.00	79.00	156.8	4,684	12.76
P. O. J. 2354	28.58	15.29	12.05	78.81	157.3	4,496	12.72
P. O. J. 2878	30.24	14.19	9.97	70.26	120.6	3,647	16.58
C. P. 71-B	20.76	15.84	12.26	77.40	158.3	3,286	12.63
C. P. 130	17.18	15.70	11.95	76.12	152.7	2,623	13.10
C. P. 766	33.16	14.95	10.93	73.11	136.1	4,513	14.70

[1] Average of three replications. Plots of one-fortieth of an acre.
[2] Preliminary analyses not made

P. O. J. 36 first-year stubble indicated in every instance a lower yield of sugar per ton of cane than P. O. J. 213, the difference ranging from 9.7 to 19.6 pounds, and averaging 12.67 pounds for the five comparative tests. At four of the test fields, although there was but little difference between the two varieties in yields of cane per acre, the yield of sugar per acre from P. O. J. 36 ranged from 391 to 869 pounds less than that from P. O. J. 213. On mixed soil at Houma P. O. J. 36 afforded 3 tons more cane per acre, but only 109 pounds more sugar per acre than P. O. J. 213.

P. O. J. 36-M first-year stubble in comparison with P. O. J. 36 gave slightly lower yields of cane in line with stubble results previously obtained. This variety, however, though slightly higher in average indicated yield of sugar per ton of cane, did not consistently maintain the superiority to P. O. J. 36 observed in past years, its yield of cane per acre and sugar per ton of cane at Greenwood and on mixed soil at Houma being slightly less than the yields from P. O. J. 36.

P. O. J. 213 first stubble afforded distinctly better results than either P. O. J. 36, P. O. J. 36–M, or P. O. J. 234, and in each of the comparative trials it usually outyielded these varieties in yields of cane and of sugar per acre. The average yield of cane per acre for the five trials in which P. O. J. 36 and 36–M were included was 26.37 tons from P. O. J. 213 as compared with 25.63 tons from P. O. J. 36 and 24.26 tons from P. O. J. 36–M. P. O. J. 213 afforded an indicated average yield of 166.44 pounds of sugar per ton of cane and, with the exception of the trial at Cypremort (Table 10), in which P. O. J. 36–M afforded a slightly higher yield, gave yields ranging from 7.2 to 19.6 pounds more sugar per ton than P. O. J. 36 or P. O. J. 36–M. In the five trials the average indicated yield of sugar per acre from P. O. J. 213 was 4,389 pounds, compared with 3,941 pounds from P. O. J. 36 and 3,761 pounds from P. O. J. 36–M. In the four trials in which P. O. J. 234 was included, this variety consistently afforded indicated yields of sugar per ton of cane ranging from 18.6 to 21.5 pounds more than the yields from P. O. J. 213, but the greater yields of cane per acre from P. O. J. 213 resulted in this variety outyielding P. O. J. 234 by an average of 316 pounds of sugar per acre.

P. O. J. 234 first stubble yielded cane of the high quality characteristic of this variety and, in spite of its usually lower yield of cane per acre than P. O. J. 36 and P. O. J. 36–M, afforded higher average yields of sugar per acre than either of these varieties. In the trial at Greenwood (Table 9) P. O. J. 234 afforded a yield of sugar per acre practically equaling the yield from P. O. J. 36, but outyielded P. O. J. 36–M by 664 pounds. In the other three trials in which it was included, P. O. J. 234 outyielded both P. O. J. 36 and P. O. J. 36–M by an average of over 350 pounds of sugar per acre. This variety, however, was under P. O. J. 213 in each of the four tests in calculated yield of sugar per acre. The difference, while almost negligible in the Raceland test, closely approximated 400 pounds in each of the others.

C. P. 807 first stubble afforded indicated yields of sugar per ton of cane 5.5 pounds greater than the yield from P. O. J. 213 on the mixed soil at Houma, but at the three other test fields its yield ranged from 0.8 to 13.6 pounds less than the yield from P. O. J. 213. However, its consistently higher yield of cane per acre at each of the four test fields, which ranged from 9.5 to 13.0 tons more per acre than the yield from P. O. J. 213, resulted in an indicated yield of sugar per acre

exceeding the yield from P. O. J. 213 by 1,100 to 2,300 pounds. The average yield of cane per acre from the four trials was 35.02 tons from C. P. 807 and 24.83 tons from P. O. J. 213, and the average yield of sugar per acre 5,693 pounds from C. P. 807 and 4,096 pounds from P. O. J. 213, a difference of 1,597 pounds in favor of C. P. 807.

Co. 281 first stubble afforded indicated yields of sugar per ton of cane slightly surpassing the yields from P. O. J. 213 in three of the four trials in which these two varieties appeared in direct comparison and practically equaled the yield from P. O. J. 213 in the fourth trial. On the mixed soil at Houma, Co. 281 outyielded P. O. J. 213 by 2.24 tons of cane per acre and 760 pounds of sugar per acre, but at the other test fields its yield of cane per acre was from 1 to 7 tons less than the yields from P. O. J. 213, and its calculated yield of sugar per acre from 120 to 1,263 pounds less than the yield from this variety. The average yield of cane per acre for the four trials was 25.17 tons from Co. 281 and 27.01 tons from P. O. J. 213, and the average yield of sugar per acre was 4,276 pounds from Co. 281 and 4,512 pounds from P. O. J. 213. Co. 281 has not so far demonstrated in the western parishes the high degree of comparative performance shown in the lower river parishes, and the poor results obtained in this test are probably due in part to relative inadaptability. However, because of the comparatively high temperature required by this variety for germination, the late spring of 1930, with temperatures prevailing lower than normal, followed by unusually dry weather, seemed to have affected this variety more adversely than the others in the test and probably resulted in a lower comparative performance than might be expected under normal seasonal conditions.

C. P. 177 first stubble fell below P. O. J. 213 in yields of cane per acre in the four trials and in indicated yields of sugar per ton of cane in three of the four trials and gave indicated yields of sugar per acre from 621 to 1,555 pounds less than the yields from P. O. J. 213. At Greenwood (Table 9) cane of this variety, as judged from its juice analyses, approximated P. O. J. 213 in quality, but, owing to its lower yield of cane, indicated a sugar production 860 pounds per acre below that of P. O. J. 213.

Table 14 summarizes the first-year stubble results obtained with P. O. J. 2878, C. P. 71–B, C. P. 130, C. P. 766, and P. O. J. 2354, in comparison with P. O. J. 213. These results and the ones obtained in the preceding year with plant cane indicate that these varieties can not compete with P. O. J. 213 and are unlikely to merit commercial consideration in Louisiana.

SECOND-YEAR STUBBLE VARIETY TESTS

Observations were continued in 1930 on four field experiments harvested in 1929 as first-year stubble,[6] and results obtained from these as second-year stubble are given in Tables 15, 16, 17, and 18. The comparatively good stands obtained with most varieties afforded an opportunity to compare in several localities the relative performance of second-year stubble of all the varieties released for commercial planting, as well as that of several others under experimental observation. The results in general confirm opinions previously formed as to the stubbling qualities of these varieties. All second-year stubble

[6] ARCENEAUX, G., and STEVENS, F. D. Op. cit., Tables 14, 15, 16, and 18.

tests were harvested during the early part of the grinding season, in accordance with the customary plantation practice. During that period in 1930 cane had not attained a very high degree of maturity, owing to delayed growth occasioned by the late spring and untimely droughts, and consequently all varieties in second-year stubble tests show a relatively low level of recoverable sugar.

TABLE 15.—*Results of second-year stubble-cane variety tests on light soil on the Godchaux plantation, Raceland, La., in 1930*

[The generalized probable error of the difference in average yield of cane per acre between any two varieties=±0.71 ton]

Variety	Acre yields of cane [1]	Laboratory-mill juice harvest analyses, [2] Oct. 27			Indicated available 96° sugar		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36	21.04	14.01	10.04	71.67	123.2	2,592	16.23
P. O. J. 36-M	20.42	14.19	10.16	71.60	124.6	2,544	16.05
P. O. J. 213	22.73	14.21	10.50	73.89	131.7	2,993	15.19
P. O. J. 228	19.35	13.21	8.66	65.56	99.3	1,921	20.15
P. O. J. 234	12.08	14.57	10.78	73.99	135.3	1,634	14.78
P. O. J. 979	18.00	13.81	9.03	65.39	103.5	1,863	19.32

[1] Average of 12 replications. Plots of one-twentieth of an acre. [2] Preliminary analyses not made.

TABLE 16.—*Results of second-year stubble-cane variety tests on light soil on the Greenwood plantation, Thibodaux, La., in 1930*

[The generalized probable error of the difference in average yield of cane per acre between any two varieties=±0.69 ton]

Variety	Acre yields of cane [1]	Laboratory-mill juice harvest analyses, [2] Nov. 4			Indicated available 96° sugar		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36	26.62	13.76	9.49	68.97	113.4	3,019	17.64
P. O. J. 36-M	25.11	14.38	10.30	71.63	126.4	3,174	15.82
P. O. J. 213	27.43	14.21	10.58	74.46	133.4	3,659	14.99
P. O. J. 228	26.41	12.75	8.12	63.69	90.9	2,401	22.00
P. O. J. 234	17.82	14.90	11.25	75.51	143.0	2,548	13.99
P. O. J. 979	26.05	14.02	9.02	64.34	101.9	2,654	19.63
P. O. J. 2725	24.46	12.56	7.77	61.87	84.7	2,072	23.62

[1] Average of 12 replications. Plots of one-twentieth of an acre. [2] Preliminary analyses not made.

TABLE 17.—*Results of second-year stubble-cane variety tests on light soil on the Cypremort plantation, Louisa, La., in 1930*

[The generalized probable error of the difference in average yield of cane per acre between any two varieties=±0.87 ton]

Variety	Acre yields of cane [1]	Laboratory-mill juice harvest analyses, [2] Oct. 22			Indicated available 96° sugar		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J 36	16.62	14.17	10.41	73.47	130.0	2,161	15.38
P. O. J. 36-M	14.07	14.52	10.93	75.28	138.8	1,953	14.41
P. O. J. 213	16.33	14.01	10.36	73.95	130.0	2,123	15.38
P. O. J. 228	8.82	12.40	8.81	71.05	103.5	913	19.32
P. O. J. 234	14.53	16.05	12.99	80.94	172.3	2,503	11.61
P. O. J. 826	----------	12.77	8.61	67.43	101.0	----------	22.10
P. O. J. 979	14.97	13.43	8.57	63.81	96.0	1,437	20.83

[1] Average of 11 replications. Plots of one-twenty-second of an acre. [2] Preliminary analyses not made.

TABLE 18.—*Results of second-year stubble-cane variety tests on mixed soil at the United States Sugar Plant Field Station, Houma, La., in 1930*

[The generalized probable error of the difference in average yield of cane per acre between any two varieties =±0.75 ton in Group 1 and ±2.85 tons in Group 2]

Variety and grouping	Acre yields of cane [1]	Laboratory-mill juice harvest analyses,[2] Oct. 22			Indicated available 96° sugar		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
Group 1:	*Tons*		*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36	23.77	13.83	9.82	71.01	119.7	2,845	16.71
P. O. J. 36–M	24.55	14.42	10.58	73.37	132.1	3,243	15.14
C. P. 177	21.48	13.43	9.20	68.50	109.3	2,348	18.30
C. P. 807	32.92	13.19	9.71	73.62	121.4	3,996	16.47
Co. 281	24.12	14.09	10.17	72.18	125.4	3,025	15.95
Group 2:							
P. O. J. 213	22.77	14.10	10.58	75.04	134.0	3,051	14.93
C. P. 71–B	4.08	15.13	11.47	75.81	146.2	596	13.68
C. P. 123	7.14	13.94	10.15	72.81	125.9	899	15.89
C. P. 177	22.24	14.59	10.67	73.13	132.8	2,953	15.06
U. S. 1444	19.65	13.45	9.03	67.17	105.6	2,075	18.94

[1] Average of 5 replications. Plots of one-fortieth of an acre. [2] Preliminary analyses not made.

P. O. J. 36 and P. O. J. 36–M second stubble afforded results so nearly alike as to indicate no advantage in favor of either variety. P. O. J. 36 held a slight advantage in yield of cane per acre, while P. O. J. 36–M held a slight advantage in indicated pounds of sugar per ton of cane. Average results for the four trials show 22.01 tons of cane per acre from P. O. J. 36 and 21.04 tons from P. O. J. 36–M, 120.58 pounds of sugar per ton of cane from P. O. J. 36 and 129.71 pounds from P. O. J. 36–M, and 2,654 pounds of sugar per acre from P. O. J. 36 and 2,729 pounds from P. O. J. 36–M.

P. O. J. 213 second stubble afforded, in general, slightly better yields of cane per acre and sugar per ton of cane than P. O. J. 36 and P. O. J. 36–M. At Cypremort (Table 17) P. O. J. 213 fell somewhat below P. O. J. 36–M in indicated yield of sugar per ton of cane, but its higher yield of cane per acre resulted in an indicated yield of sugar per acre slightly higher than the yield from the latter variety. Average results for the four trials show 22.32 tons of cane per acre from P. O. J. 213 as compared with 22.01 tons from P. O. J. 36 and 21.04 tons from P. O. J. 36–M, 132 pounds of sugar per ton of cane from P. O. J. 213 as compared with 120.58 pounds from P. O. J. 36 and 129.71 pounds from P. O. J. 36–M, and 2,957 pounds of sugar per acre from P. O. J. 213 as compared with 2,654 pounds from P. O. J. 36 and 2,729 pounds from P. O. J. 36–M.

P. O. J. 234 second stubble afforded relatively better yields than those obtained in previous second-stubble trials. However, in the three trials in which each of these varieties were included, yields of cane per acre ranged from approximately 2 to approximately 10 tons less than the yields from P. O. J. 36, P. O. J. 36–M, and P. O. J. 213, except at Cypremort where the yield of cane from P. O. J. 36–M was about half a ton less than that from P. O. J. 234. P. O. J. 234 exceeded all other varieties in indicated pounds of sugar per ton of cane, averaging 150.44 pounds as compared with 132 pounds from P. O. J. 213. At Cypremort (Table 17) its indicated yield of 172.3 pounds of sugar per ton of cane resulted in an indicated yield of sugar per acre of

2,503 pounds as compared with 2,123 pounds from P. O. J. 213, but at Raceland (Table 15) it afforded only 1,634 pounds as compared, with 2,993 pounds from P. O. J. 213 and at Greenwood (Table 16) 2,548 pounds as compared with 3,659 pounds from P. O. J. 213.

C. P. 807, second stubble of which appeared only in the trial at Houma (Table 18), displayed its unusually strong stubbling quality, yielding 32.92 tons of cane per acre as compared with 22.77 tons from P. O. J. 213 and 24.55 tons from P. O. J. 36–M. Its indicated yield of sugar per ton of cane was lower than the yield from either P. O. J. 213 or P. O. J. 36–M, but its greater yield of cane per acre resulted in an indicated yield of 3,996 pounds of sugar per acre as compared with 3,051 pounds from 213 and 3,243 pounds from 36–M.

Co. 281, second stubble of which also appeared only in the trial at Houma (Table 18), afforded poorer results than were expected, as judged by its performance as plant and as first-stubble cane in previous years. It afforded 24.12 tons of cane per acre and an indicated yield of 125.4 pounds of sugar per ton as compared with 22.77 tons and 134 pounds from P. O. J. 213 and 24.55 tons and 132.1 pounds from P. O. J. 36–M. These comparatively poor results were undoubtedly due in part to the slow growth of this variety during the cool spring of 1930 and in part to unduly protracted "suckering" induced by the gappy stand obtained as a result of the inadequate quantity of seed cane originally planted, conditions which should be borne in mind in connection with interpreting the results. In spite of these disadvantages, however, Co. 281 second stubble afforded an indicated yield of 3,025 pounds of sugar per acre as compared with 3,051 pounds from P. O. J. 213 and 3,243 pounds from P. O. J. 36–M.

P. O. J. 228 and P. O. J. 979 second stubble, which appeared in three trials, gave indicated yields of sugar per acre consistently under those obtained with any of the varieties now being cultivated and afforded cane of unprofitably low quality. These two varieties have conclusively demonstrated their unfitness for commercial cultivation in Louisiana.

MILL TESTS

Well-controlled mill tests were conducted at the Godchaux factory at Raceland and at the Southdown factory of the estate of H. C. Minor at Houma for the purpose of determining the comparative milling properties of C. P. 807 and Co. 281. The results of these tests are summarized in Tables 19 and 20. Except where otherwise stated, all data in these tables were furnished by the respective factory managements and are based entirely on actual factory results obtained in the tests.

The percentage of sucrose extraction obtained with C. P. 807 in these two tests did not differ materially from that obtained with P. O. J. 213, and while the normal extraction was somewhat lower than in the case of P. O. J. 213, it compared favorably with that of P. O. J. 36–M at Raceland, where the two varieties were included in the same test. In the dry milling test at Southdown, Co. 281 gave normal extraction and percentage of sucrose extraction slightly under those of P. O. J. 213, though the difference is probably not significant. This variety, as judged from this test and previous ones in which it gave slightly higher extraction than P. O. J. 213, is on a par with P. O. J. 213 from a standpoint of normal extraction or of sucrose extraction.

TABLE 19.—*Summarized results of comparative mill tests conducted on first-stubble cane at the Godchaux factory, Raceland, La., November 12, 1930*

Variety	Quantity of cane milled	Duration of test	Maceration [1]	Normal extraction	Sucrose extraction	Fiber in cane	Indicated available 96° sugar per ton of cane based on—	
							Mill results [2]	Usual laboratory procedure with corresponding samples selected from the field and crushed in the Houma laboratory mill [3]
	Tons	*Minutes*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Pounds*	*Pounds*
C. P. 807	10.440	18	18.85	74.77	91.44	14.65	153.88	156.9
P. O. J. 36-M	7.778	13	18.59	73.34	89.20	13.85	160.00	158.2
P. O. J. 213	7.466	10	17.30	78.56	92.15	11.63	168.96	165.4

[1] Based on venturimeter reading.
[2] B. H. E. number=98.
[3] Table 8.

TABLE 20.—*Summarized results of comparative dry milling tests on plant cane conducted at the Southdown factory, Houma, La., December 12, 1930*

Variety	Quantity of cane milled	Normal extraction	Sucrose extraction	Fiber in cane	Indicated available 96° sugar per ton of cane
	Tons	*Per cent*	*Per cent*	*Per cent*	*Pounds*
C. P. 807	29.530	69.83	87.72	13.25	133.70
Co. 281	31.647	70.78	85.09	12.51	161.88
P. O. J. 213 [1]	32.240	72.39	87.59	11.48	169.23

[1] P. O. J. 213 cane from a source different from that of the other two varieties, and its sugar content is not comparable.

Milling tests with C. P. 807 and Co. 281 were conducted at the Caldwell & Moresi factory at Erath and at the Burguieres factory on Cypremort plantation, where, owing to lack of proper facilities, actual extraction figures could not be obtained, but where further opportunity was afforded to determine in a general way the comparative milling qualities of the two new varieties. As a result of these four factory tests, Co. 281 was pronounced a comparatively easy cane to grind, approximating P. O. J. 213 in this respect. C. P. 807 appears to be slightly harder to grind than the P. O. J. varieties now being grown in Louisiana, but all information available indicates that cane of this variety can be handled without difficulty at the four factories mentioned, or at factories similarly equipped.

The tabulated summary covering the Raceland factory test (Table 19) includes calculated yields of sugar per ton of cane for the three varieties from corresponding field samples of cane as determined by the laboratory method previously described. These values are in close agreement with the factory results.

SUMMARY OF DATA, 1926–1930

Plant cane and first-year stubble variety test data given in this and similar publications previously issued, covering the period 1926 to 1930, inclusive, are summarized in Tables 21 and 22. As will be noted by referring to the brief weather summary given for each year, this period covers a wide range of weather conditions, involving, generally speaking, all of the usual and some of the unusual combinations to be expected in the sections in Louisiana where sugarcane is cultivated. The year 1926 presented the worst weather combination of the period, and the effects are clearly shown on yields and sugar content of cane. The year 1927, with its long frost-free period, favorable growing conditions during the summer months, and dry fall, combined about as many favorable conditions as can be expected. In 1928 were experienced most of the unfavorable weather conditions presented in 1926 with the exception of the hurricane. The first part of 1929 was exceedingly favorable. The warm spring permitted early germination and growth, and the timely rainfall during the summer months rendered conditions favorable for rapid development. As a result, cane of all varieties had reached an unusually high level of growth and sugar content by the time harvesting operations were started. Excessive rainfall during October and November greatly delayed maturity, and the cane, particularly plant cane, did not reach the high level of sugar content promised earlier in the season. In 1930 conditions were the reverse of those of 1929. The late, cool spring and dry, early summer materially delayed growth and resulted in very green cane at the beginning of grinding operations, but owing to favorable weather conditions during the fall months, the cane reached a generally satisfactory level of sugar content, particularly during the latter part of the grinding season.

TABLE 21.—*Summary of average yearly results obtained with important varieties of sugarcane in plant-cane variety tests, 1926–1930*

Variety	Results in 1926.[1] (Late, cool spring; destructive hurricane in August; warm, moist fall)				Results in 1927.[2] (Early, warm spring; long, favorable growing season; dry and cool fall; late freeze)				Results in 1928.[3] (Late, cool spring; moist, warm fall; early freeze)			
	Field tests	Average acre yields of cane	Indicated available 96° sugar		Field tests	Average acre yields of cane	Indicated available 96° sugar		Field tests	Average acre yields of cane	Indicated available 96° sugar	
			Per ton of cane	Per acre			Per ton of cane	Per acre			Per ton of cane	Per acre
	Number	*Tons*	*Pounds*	*Pounds*	*Number*	*Tons*	*Pounds*	*Pounds*	*Number*	*Tons*	*Pounds*	*Pounds*
P. O. J. 36	3	18.64	115.88	2,160	1	23.10	165.1	3,814	5	29.11	135.1	3,933
P. O. J. 36–M					1	20.00	180.9	3,618	5	29.22	152.8	4,465
P. O. J. 213	3	20.61	134.06	2,763	1	24.50	181.8	4,454	5	31.29	150.3	4,703
P. O. J. 234	3	20.27	138.43	2,806	1	20.90	191.9	4,011	5	23.62	178.5	4,216
C. P. 807									[6] 1	50.86	127.5	6,485
Co. 281									[6] 1	25.31	131.1	3,318

[1] RANDS, R. D., and SHERWOOD, S. F. Op. cit. (Tables 3 and 6.)
[2] RANDS, R. D., SHERWOOD, S. F., and STEVENS, F. D. Op. cit. (Table 5.)
[3] ARCENEAUX, G., and STEVENS, F. D. Op. cit. (Tables 2 and 8.)
[6] Houma only.

TABLE 21.—*Summary of average yearly results obtained with important varieties of sugarcane in plant-cane variety tests, 1926–1930*—Continued

Variety	Results in 1929.[4] (Early, warm spring; moist, favorable summer; moist, warm fall; early freeze)				Results in 1930.[5] (Late, cool spring; dry summer; fall approaching normal, with slight excess of rain; late freeze)			
	Field tests	Average acre yields of cane	Indicated available 96° sugar		Field tests	Average acre yields of cane	Indicated available 96° sugar	
			Per ton of cane	Per acre			Per ton of cane	Per acre
	Number	*Tons*	*Pounds*	*Pounds*	*Number*	*Tons*	*Pounds*	*Pounds*
P. O. J. 36	5	29.47	151.1	4,453	[6] 2	25.31	147.18	3,725
P. O. J. 36-M	5	29.99	155.5	4,663	6	24.83	159.16	3,952
P. O. J. 213	5	30.25	156.9	4,746	6	24.42	165.60	4,044
P. O. J. 234	5	26.93	178.9	4,818	6	23.81	187.48	4,464
C. P. 807	3	41.49	162.5	6,742	[7] 6	32.97	163.33	5,385
Co. 281	3	31.49	186.0	5,857	[8] 6	26.55	185.00	4,912

[4] ARCENEAUX, G., and GIBBENS, R. T., jr. Op. cit. (Table 9.)
[5] Summarizing Tables 2, 3, 4, 5, 6, and 7 in this publication.
[7] Houma, Raceland, and Erath.
[8] Houma, Raceland, and Cypremort.

TABLE 22.—*Summary of average yearly results obtained with important varieties of sugar cane in first-year stubble-cane variety tests, 1927–1930*

Variety	1927 [1]				1928 [2]			
	Field tests	Average acre yields of cane	Indicated available 96° sugar		Tests	Average acre yields of cane	Indicated available 96° sugar	
			Per ton of cane	Per acre			Per ton of cane	Per acre
	Number	*Tons*	*Pounds*	*Pounds*	*Number*	*Tons*	*Pounds*	*Pounds*
P. O. J. 36	3	24.77	169.69	4,203	1	27.59	125.0	3,449
P. O. J. 36-M					1	20.99	136.5	2,865
P. O. J. 213	3	23.53	190.23	4,476	1	28.68	130.1	3,731
P. O. J. 234	3	15.90	182.20	2,897	1	19.43	150.3	2,920
C. P. 807								
Co. 281								

Variety	1929 [3]				1930 [4]			
	Field tests	Average acre yields of cane	Indicated available 96° sugar		Tests	Average acre yields of cane	Indicated available 96° sugar	
			Per ton of cane	Per acre			Per ton of cane	Per acre
	Number	*Tons*	*Pounds*	*Pounds*	*Number*	*Tons*	*Pounds*	*Pounds*
P. O. J. 36	5	29.57	163.8	4,844	5	25.63	153.77	3,941
P. O. J. 36-M	5	28.79	176.5	5,081	5	24.26	155.03	3,761
P. O. J. 213	5	31.62	172.2	5,445	5	26.37	166.44	4,389
P. O. J. 234	4	25.21	197.5	4,978	4	21.08	188.05	3,964
C. P. 807	[5] 1	42.83	163.5	7,003	[6] 3	33.22	163.00	5,415
Co. 281	[5] 1	32.66	192.1	6,274	[7] 3	24.04	171.92	4,133

[1] RANDS, R. D., SHERWOOD, S. F., and STEVENS, F. D. Op. cit. (Tables 3 and 7.)
[2] ARCENEAUX, G., and STEVENS, F. D. Op. cit. (Table 11.)
[3] ARCENEAUX, G., and GIBBENS, R. T. JR., Op. cit. (Table 19.)
[4] Summarizing Tables 8, 9, 10, 11, and 12 in this publication.
[5] Houma only.
[6] Houma, Raceland, and Erath.
[7] Houma, Raceland, and Cypremort.

DISCUSSION AND CONCLUSIONS

FOR CROP YEAR 1929-30

The results of sugarcane variety tests reported in this publication are, generally speaking, in remarkably close agreement with results obtained in previous years.

P. O. J. 213 continues to be the leading one of the four released P. O. J. varieties. In spite of plant cane of this variety having suffered considerably from the effect of adverse weather conditions prevailing during the winter of 1929–30, which resulted in a comparative performance below that of previous years, it afforded yields of cane equaling the yields of P. O. J. 36, P. O. J. 36–M, and P. O. J. 234, none of which was so adversely affected by the unfavorable weather conditions. P. O. J. 213 plant cane afforded average indicated yields of sugar per acre slightly exceeding the yields from P. O. J. 36 and P. O. J. 36–M, but as the result of the characteristically higher yield of sugar per ton of cane from P. O. J. 234, fell below this variety in average yield of sugar per acre. As first stubble and as second stubble, P. O. J. 213 exceeded P. O. J. 36, P. O. J. 36–M, and P. O. J. 234 in yields of cane and of sugar per acre. Considered from the standpoint of plant cane, first stubble, and second stubble combined, P. O. J. 213 afforded cane of generally satisfactory quality and produced more sugar per acre than any other P. O. J. variety. However, plant cane of P. O. J. 213 suffered considerably more from red rot during the winter and spring of 1929–30 and of 1930–31 than in previous years, and it appears likely that its apparent susceptibility to injury from the attack of this disease may seriously impair the usefulness of this variety in the future.[7]

P. O. J. 36 displayed its usual low sugar content as compared with P. O. J. 213. In the 11 plant-cane and stubble tests in which this variety occurred comparably with P. O. J. 213, its indicated yield of sugar per acre approximated that of P. O. J. 213 in only three instances—in the Houma plant-cane test (Table 7) and the Cypremort second-year stubble test (Table 17), where the quantities were practically equal, and in the Houma first-year stubble test (Table 12), where P. O. J. 36 was slightly higher. In the 8 other tests, P. O. J. 36 gave calculated yields of sugar per acre well under those of P. O. J. 213, the difference ranging from 206 to 869 pounds. P. O. J. 36 afforded cane of a quality distinctly inferior to that of P. O. J. 213 as judged from juice analyses.

P. O. J. 36–M, generally speaking, exceeds P. O. J. 36 in indicated yield of sugar per ton of cane, but the difference was not as great as observed in previous years. A study of plant-cane, first-year stubble and second-year stubble results, shows that P. O. J. 36–M, in spite of its slightly lower yields of cane, maintained a slight superiority over P. O. J. 36 in average indicated production of sugar per acre. In most of the tests its calculated yields of sugar per ton of cane and per acre were materially under corresponding yields from P. O. J. 213.

P. O. J. 234 maintained its customary lead in indicated yield of sugar per ton of cane. This variety withstood relatively well the unfavorable weather conditions during the winter of 1929–30 and

[7] ABBOTT, E. V. RED ROT AS A FACTOR IN THE PLANTING PROGRAM. Sugar Bul. 10: 5. 1931.

gave better comparative yields of cane than in previous years. Its yield of cane per acre was usually less than the yield from P. O. J. 213, but as a result of its consistently higher sugar content it frequently afforded yields of sugar per acre, both from plant cane and from first stubble, which compared favorably with the yields from P. O. J. 213.

The results obtained with C. P. 807 and Co. 281 in the experiments summarized fully substantiate previously formed conclusions, which in 1930 prompted the United States Department of Agriculture and cooperating agencies to release these two varieties for general planting and to recommend them for commercial cultivation.

C. P. 807 afforded cane comparing favorably with P. O. J. 213 in juice analysis and in indicated yield of sugar per ton of cane and consistently surpassed every one of the released varieties in yields of cane per acre and sugar per acre, both as plant cane and as stubble cane, at each of the test fields. As plant cane, C. P. 807 outyielded P. O. J. 213 by an average of 8.48 tons of cane and 1,332 pounds of sugar per acre; as first stubble it outyielded P. O. J. 213 by an average of 10.19 tons of cane and 1,597 pounds of sugar per acre; and as second stubble, in a single trial only, it outyielded P. O. J. 213 by 10.15 tons of cane and 945 pounds of sugar per acre.

Co. 281 germinated later and grew slowly as the result of the unfavorable conditions prevailing during the early part of 1930 and did not afford yields of cane per acre and indicated yields of sugar per ton of cane as high as were expected from the results of its performance in 1929. This was particularly true of the stubble of this variety. However, in the stubble trials, which were harvested in November or late in October, it afforded a slightly higher average indicated yield of sugar per ton of cane than the yield from P. O. J. 213 and an average yield of sugar per acre but slightly under it. During November and December Co. 281 plant cane ripened very rapidly, and at the time that the plant-cane trials were harvested (November 22 to December 16), cane of this variety afforded a general level of sugar per ton of cane exceeding that from P. O. J. 213 and only slightly below that from P. O. J. 234. As a result of its good yield of plant cane per acre, Co. 281 in each of the six trials afforded an indicated yield of sugar per acre higher than the yield from any of the released P. O. J. varieties. Co. 281 plant cane outyielded P. O. J. 213 plant cane by an average of 2.06 tons of cane per acre and 862 pounds of sugar per acre. In the western parishes of St. Mary, Iberia, and Vermilion this variety has not shown the high degree of adaptability displayed in the river parishes.

The results of continued trials of P. O. J. 979, P. O. J. 228, P. O. J. 826, P. O. J. 2878, C. P. 71–B, C. P. 130, C. P. 177, and C. P. 766 do not indicate in any case a high degree of adaptability, and it is not probable that any of these varieties will merit commercial consideration in Louisiana.

Factory mill tests with C. P. 807 and Co. 281, the results of which are in agreement with results obtained in tests carried on in 1929, indicate that no unusual difficulty should be encountered in milling cane of these varieties, in spite of the fact that C. P. 807 cane in particular appears to be somewhat harder to grind than P. O. J. 213.

FOR 5-YEAR PERIOD

Since the introduction of P. O. J. varieties in Louisiana, P. O. J. 213 has become generally established as the standard variety. In comparing the results obtained with this variety in plant-cane and stubble tests (Tables 21 and 22), it is apparent that, in so far as P. O. J. varieties are concerned, it is entitled to first place. Its record of satisfactory comparative performance in good and in bad years is outstanding. It is, however, subject to severe lodging, particularly under very favorable growth conditions, which has the effect of seriously interfering with its ripening, in addition to presenting at times considerable difficulties in handling. Its apparent susceptibility to injury from the attack of red rot is another weakenss which may seriously impair its usefulness in the future.

P. O. J. 36 has consistently produced cane of lower quality than P. O. J. 213, with comparatively lower acre yields of cane. These disadvantages appear to more than offset the advantages afforded by its larger barrel and greater resistance to lodging, and the results apparently do not justify the planting of this variety on an extensive scale.

While experiments with P. O. J. 36–M do not extend over as long a period as do those with some of the other P. O. J. varieties, the results indicate that this cane is distinctly perferable to P. O. J. 36. It has afforded cane of a quality generally comparable to that of P. O. J. 213, though its yields of cane per acre have been generally lower. However, this disadvantage appears to be partly compensated for by the superior field handling qualities resulting from its larger barrel and comparatively erect growth.

The unusually high quality of cane consistently afforded by P. O. J. 234 undoubtedly justifies the continued cultivation of this variety, in spite of its comparatively poor stubbling qualities and comparatively low yields of cane. It appears desirable to devote a certain acreage to this early-ripening variety, in order to make cane of a millable quality available for early grinding.

C. P. 807, during the three years that it has been grown in comparative plantation tests, has consistently indicated a remarkably high production of cane and of sugar per acre and has afforded cane for the most part comparable with P. O. J. 213 in juice analyses. Its fiber content, which is higher than that of P. O. J. 213, may necessitate slight adjustments in mill control and slight changes and readjustment of the milling equipment at some of the smaller factories, but the results of four comparative factory tests conducted with this variety at the estate of H. C. Minor Southdown factory and the Godchaux Raceland factory indicate that cane of this variety can be satisfactorily handled with such equipment as is found at these factories. C. P. 807, on account of its recumbent habit of growth, is more difficult to harvest and transport than varieties such as P. O. J. 36–M, which have a more erect habit of growth. Its characteristically crooked stalk prevents the loading of carts and cars in present use to their normal weight capacity, and the extensive planting of this variety will undoubtedly necessitate a modification of existing transportation facilities. This variety, on account of its extreme vigor and demonstrated ability to produce very large yields of both plant and stubble cane of a quality comparing favorably with P. O. J.

213 on the poorly drained, heavy soils comprising approximately 30 per cent of the Louisiana sugarcane area and of hitherto doubtful agricultural value, promises to play an important part in extending the profitable sugar-producing area of Louisiana. Considering every characteristic studied, including its resistance to red rot in the field,[8] its tolerance of cold,[9] and the qualities reported in this paper, the variety C.P.807 is sufficiently superior to warrant its use in substantial amounts in commercial plantings for the crop of 1931–32.

Co. 281, during the comparatively short time that it has been under observation, has demonstrated an adaptability to Louisiana conditions worthy of serious consideration. It has produced cane of conclusively higher sugar content than that of P. O. J. 213, and during the latter part of the grinding season, when cane of this variety appears to best advantage, it has in many instances threatened the supremacy of P. O. J. 234 in yield of sugar per ton of cane. In 1929 this variety produced cane of an unusually high quality throughout the grinding season, while in 1930 it was unquestionably not as ripe as P. O. J. 234 during the months of October and November. This difference was probably due, in part at least, to unfavorable weather conditions early in the year, which retarded the germination and growth of this variety. Just how satisfactory this variety will be for early grinding under normal conditions remains to be definitely determined, but there appears to be a possibility that it may ripen sufficiently early to afford cane comparing favorably with P. O. J. 234 for early grinding if topped somewhat low. The stubbling qualities of Co. 281, especially when the cane is harvested early in the season, appear to be distinctly superior to those of P. O. J. 234.

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[8] ABBOTT, E. V. Op. cit.

[9] RANDS, R. D., MCKAIG, NELSON, JR., and BISLAND, RALPH. DETERIORATION TEST OF STANDING AND WINDROWED PLANT CANE OF FOUR LEADING VARIETIES ON LAUREL GROVE PLANTATION, THIBODAUX, LOUISIANA. Sugar Bul. 9:4. 1931.

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